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REVIEW ARTICLE

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A discourse on dental hygiene education in Canada

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Abstract: Over the past decade, the discourse on dental hygiene education has gained momentum in Canada. This review provides insights into the evolution of dental hygiene education in Canada, briefly exploring the history and professional influences for diploma and baccalaureate education within the profession. The profession in Canada has yet to implement a national standardized entry-to-practice educational model, but the recent development of national educational competencies may prove to be a promising beginning. The review also discusses efforts to advance dental hygiene education in recent years, while exploring the political and professional pressures and challenges that remain. Further discourse on education and outcomes-related research can be effective in positively influencing governmental, professional and public opinions of higher entry-level education for dental hygiene which may ultimately result in regulatory change and improved client outcomes.

Key words: competencies; dental hygiene baccalaureate degree; dental hygiene diploma; dental hygiene education; dental hygiene in Canada; dental hygienists; entry-to-practice education

Introduction

Dental hygiene is a growing profession in Canada. Not only has there been a dramatic increase in the number of dental hygienists in recent years across the country, but the profession has also established self-regulation in almost all provinces. One continuing challenge in dental hygiene, however, has been entry-to-practice educational standards. Current dental hygiene entry-to-practice education in Canada is eclectic. The diverging evolution of dental hygiene education over the past few decades has resulted in a diversity of programmes which vary in prerequisites, length and institutional setting. Dental hygienists in Canada are educated primarily through entry-level 2-year or 3-year diploma programmes (1). Dental hygienists with a diploma who desire additional dental hygiene education can choose from four baccalaureate degree-completion programmes in universities across the country. Canada also has one 4-year entry-to-practice dental hygiene baccalaureate programme (Table 1).

The scope of professional practice does not change whether one has a 2-year diploma, a 3-year diploma or a baccalaureate degree. However, each province and territory has its own dental hygiene regulatory body. Because of the variations between regulatory bodies, dental hygiene's scope of practice is not uniform across Canada, a factor that makes educational reform and consistency quite challenging. Despite the plethora of

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Table 1. **Dental hygiene education programme models in Canada**

Educational model	Province
2-year diploma	New Brunswick Ontario Saskatchewan
3-year diploma	Alberta British Columbia Manitoba Nova Scotia Quebec
Baccalaureate degree-completion	Alberta British Columbia Manitoba Nova Scotia
4-year entry-to-practice Baccalaureate degree	British Columbia

programme options for diploma and baccalaureate education, the entry-to-practice requirement for dental hygiene in Canada continues to be the diploma. An exploration into the past few decades is intended to help identify the slow but progressive movement in Canada towards advancing dental hygiene entry-to-practice education to the baccalaureate degree level.

Dental hygiene diploma education

The impetus for the development of dental hygiene programmes in Canada initially stemmed from the dental profession with a desire to increase access to dental care, particularly preventive services (2). The first dental hygiene programme in Canada was a 2-year diploma programme, established in 1951 at the University of Toronto (3). A second programme followed in 1956, implemented through the Canadian Armed Forces Dental Services (2). Four additional university-based dental hygiene diploma programmes opened during the 1960s: the University of Alberta (1961), Dalhousie University (1961), the University of Manitoba (1963) and the University of British Columbia (1968) (2, 3).

Initially, the Canadian Dental Association (CDA) had recommended that dental hygiene programmes be offered through faculties of dentistry within universities (2). However, with the rapid growth of community colleges and technical institutes in the 1970s and 1980s, Canadian dental hygiene diploma programmes were discontinued in universities. Political and economic factors also fuelled the closure of dental hygiene diploma programmes in universities, many of which reopened in community colleges in provinces such as British Columbia and Ontario (3).

The first Ontario college dental hygiene programme was established at Algonquin College in 1974, followed by a programme at George Brown College in 1976. Shortly thereafter, the diploma programme at the University of Toronto closed in 1978 (2). In British Columbia, the diploma programme at the University of British Columbia (UBC) closed in 1986 and students were transferred to a new diploma programme which opened at Vancouver Community College. Two additional diploma programmes were established at the College of New Caledonia and Camosun College in the following 3 years (2). Over the past decade, numerous new diploma programmes across Canada have opened. Diploma programmes in Canada involve 2 years of specific dental hygiene instruction; however, prerequisites for some programmes include secondary school matriculation whereas other programmes require a minimum of first year university education in general sciences. At the time of this review, there are 49 dental hygiene diploma programmes in Canada: 32 of these programmes require 2 years of study and 17 programmes require 3 years (including the prerequisite university year of study) (1). With regard to institutional setting, 44 of these diploma programmes are located within community colleges or technical and private institutions; only five are university-based.

Over the past few years, there has also been a proliferation of private businesses offering diploma level dental hygiene education in Canada. This rapid growth of 2-year private dental hygiene programmes was in large part due to the CDA's concerns over the shortage of dental hygienists in Canada, an issue which first surfaced in the late 1990s (4). At that time, with an increased demand by clients for more preventive services, the CDA was convinced that there was an inadequate number of dental hygienists in Canada to meet the needs of many dental offices (4). In addition to opening more diploma programmes to address this perceived shortage, provincial dental hygiene regulatory bodies were pressured to increase the practice mobility for dental hygienists across Canada.

For example, in British Columbia in 2004, with campaigning pressure from the British Columbia Dental Association, the College of Dental Hygienists of British Columbia amended their bylaws to create a process to allow graduates from non-accredited programmes, including foreign educated hygienists, to become licensed (4). This amendment opened the door for dental hygienists educated in other provinces to practice in British Columbia, despite different entry-level dental hygiene education. The increase in practice mobility between all provinces has brought more attention to the need to have standardized educational qualifications for all Canadian dental hygienists.

Today, there are approximately 20 000 dental hygienists in Canada, roughly 14 000 of whom are members of the Canadian Dental Hygienists Association (CDHA), the voluntary national professional organization, a number that has risen by approximately 45% since 2003 (1, 3, 5). According to the 2009 CDHA *National Dental Hygiene Job Market and Employment Survey* conducted with 3151 dental hygienists in Canada, roughly an equal number of Canadian dental hygienists have earned either a 2-year diploma or a 3-year diploma (5).

Dental hygiene baccalaureate education

Dental hygiene diploma education remains focused around a clinical practice model which is thought to limit the opportunity to socialize dental hygienists beyond the traditional

clinical role of client care (6, 7). Dental hygiene baccalaureate education utilizes a broader academic model, preparing graduates for expanded roles (7). The past decade has been witness to a growing movement towards the advancement of dental hygiene education to a baccalaureate degree in Canada. The impetus for advancing education stems from a sense of responsibility to address the growing oral health complexities of the public (not only clinically but also in the community and at the level of policy making), a need for dental hygiene research conducted by dental hygienists, a demand for qualified dental hygiene educators (8, 9) and a desire to advance the profession (9).

Dental hygienists with a dental hygiene baccalaureate degree in Canada have either continued their formal education in one of four degree-completion programmes or have completed a 4-year entry-to-practice university programme. In 1971, the University of Montreal became the first institution (francophone) in Canada to offer a dental hygiene degree-completion programme, followed by the University of Toronto in 1977. As a result of budgetary, enrolment and political issues, the University of Montreal's programme was discontinued in 1979 as was the University of Toronto's programme in 2001 (2, 3, 10). UBC, the University of Alberta and Dalhousie University have offered degree-completion since 1992, 2000 and 2008 respectively (11–13). Most recently, the University of Manitoba accepted its first dental hygiene degree-completion students in 2010 (S. Lavigne, personal communication). In addition to its degree-completion options, UBC, in 2007, implemented Canada's first and only 4-year entry-to-practice dental hygiene baccalaureate option within its programme (11). From the 3151 Canadian dental hygienists surveyed in 2009, only 532 (16.9%) had earned a baccalaureate degree (either prior to or after their dental hygiene diploma education), of whom only 147 (4.7%) had completed a baccalaureate degree in dental hygiene (5).

Incorporating advanced theory within a broader context in dental hygiene education in large part stems from a need to improve ability-based outcomes for dental hygiene graduates (8). According to the World Health Organization, building the abilities of the health care workforce to address the rising prevalence of chronic and preventable diseases in the 21st century is an issue of increasing importance internationally (14, 15). The abilities required in dental hygiene to support quality care for a population with increasing health complexities include: using credible research to inform practice decisions, translating research to assist clients in understanding health issues, transferring information to clients and other health professionals, working collaboratively on interdisciplinary teams and taking a leadership role in healthcare delivery (8). The focus of educational organizations is directed towards the alignment of entry-to-practice programmes that are able to integrate these abilities in dental hygiene graduates and towards laying the foundation for continued studies at the graduate degree level (8, 9). Dental hygiene baccalaureate degree education in Canada provides a broader education, a more independent learning environment and a stronger focus on critical thinking compared with learning experiences in dental hygiene diploma programmes (16). Longer educational programmes, in general, have been shown to support the development of greater abilities in the use of research and critical thinking that have been found to result in improved client outcomes (17, 18). Dental hygienists, therefore, need to be provided with access to educational pathways, such as baccalaureate and graduate level education, to develop their full capacity (8).

The CDHA has supported baccalaureate level education for dental hygiene for many years. The association recognizes that dental hygiene education must accommodate to an expanding body of dental hygiene theory, changing population demographics, new oral disease patterns and varied dental hygiene practice environments with increasing levels of responsibility (8, 19). In 2000, the CDHA passed a policy statement endorsing the baccalaureate degree as the entry-to-practice credential by 2005 for all dental hygiene students commencing their studies in that year (20). This policy statement reflected an audacious goal, one to stimulate action given the limited number of baccalaureate programmes. Unlike many other health care professions in Canada, dental hygiene has not been able to establish baccalaureate degree education as the entry-to-practice credential.

Social, economic and political resistance from a variety of sources continue to prevail, including within governmental policies and from both the dental and dental hygiene professions (3, 21). One decade after the acceptance of this policy statement, establishing baccalaureate education as the entry-to-practice credential still remains an important goal of the CDHA, as stated in its 2009 *Dental Hygiene Education Agenda* (8).

International dental hygiene education

In Johnson's 2009 comparative study on international dental hygiene practice, the majority of entry-level programmes noted internationally were 2–3 year diploma or associate degree programmes (22). Dental hygiene baccalaureate degree education is the entry-to-practice requirement in just four countries: Finland, Italy, the Netherlands and Slovakia (22). Four of these entry-to-practice baccalaureate degree programmes were reported for Finland and for the Netherlands and three baccalaureate programmes for Slovakia; specifics for Italy were missing. In comparison, the United States of America offers 51 accredited 4-year Bachelor of Science in Dental Hygiene programmes and 47 dental hygiene baccalaureate degree-completion programmes (23). However, the entry-to-practice credential for dental hygiene practice in the United States continues to be the associate degree, where there are currently 270 programmes, similar to Canada's dental hygiene diploma (9, 23).

Dental hygiene education continues to evolve internationally. Although most entry-level programmes consist of 2–3 years of post-secondary education, changes in curriculum are anticipated for 17 of the 21 countries examined in Johnson's comparative study. Cited most frequently were expected

changes in the length of entry-level programmes, expanding curriculum to the baccalaureate level (22).

There are currently no graduate level dental hygiene programmes in Canada. Although there are several general Master of Science in Dental Science programmes open to oral health professionals, Canadian dental hygienists must currently access programmes internationally for discipline-specific (dental hygiene) graduate education. For example, in the United States, there are currently 14 Master of Science in Dental Hygiene programmes (23). In addition to the United States, masters programmes in dental hygiene can be found in Finland, Italy and the Netherlands and are pending approval in Australia and Norway (22). No countries currently have doctoral programmes in dental hygiene, although one is reportedly under development in Norway (22).

National educational competencies

The dental hygiene profession, until recently, had several national documents pertaining to entry-to-practice issues. The need for a national educational standard has become increasingly evident over recent years with the divergence of entry-to-practice educational models across the country, the implementation of new programmes in multiple post-secondary institutions in new jurisdictions, and the increase in practice mobility between Canadian provinces. National dental hygiene organizations identified the need to articulate standards about the knowledge and abilities required for entry-to-practice. The competency approach was adopted to provide a way to communicate these standards which could then be used to support dental hygiene education and develop curricula, assess programmes through accreditation, examine graduates and develop provincial regulatory standards (24).

In January 2010, the *Entry-to-Practice Competencies and Standards for Canadian Dental Hygienists* document was approved. These National Dental Hygiene Competencies (NDHCs) were created in collaboration with the major stakeholders within the profession in Canada: the CDHA, the Federation of Dental Hygiene Regulatory Authorities, the Commission on Dental Accreditation of Canada, the National Dental Hygiene Certification Board and dental hygiene educators (25). The NDHCs include: '… the abilities that dental hygienists require to practice competently and responsibility' (25, p. 3). The competencies are divided into core abilities and abilities related to client services provided by the dental hygienist (Table 2). The core abilities reflect the shared abilities that dental hygienists have with other health care professionals. The description of these core abilities is then followed by the client service abilities which articulate the specialized services provided by dental hygienists (24). The core abilities involve the dental hygienist as a professional, communicator and collaborator, critical thinker, advocate and coordinator (25). The abilities related to client services involve the dental hygienist as a clinical therapist, oral health educator and health promoter (25). This document provides dental hygiene educational programmes with overarching ability statements which reflect a consistent national standard for entry-to-practice into the dental hygiene profession in Canada.

Table 2. **The 2010 Canadian National Dental Hygiene Competencies for Entry-to-Practice which are divided into core abilities and dental hygiene services provided by the dental hygienist (26)**

National dental hygiene competencies for entry-to-practice	
Core abilities	Professional
The dental hygienist as a …	Communicator and Collaborator
	Critical thinker
	Advocate
	Coordinator
Dental hygiene services	Clinical therapist
The dental hygienist as a …	Oral health educator
	Health promoter

The NDHCs, however, were not linked with a specific credential given that the mandate of the participating organizations varied; linking the competencies to a specific credential would have precluded the collaborative initiative. It was decided to focus the competencies on the abilities required to meet the public healthcare needs of the 21st century, and it was believed that this approach would support the advancement of dental hygiene education. The NDHC document does state that educators and researchers may enhance the competencies as required. Therefore, UBC's dental hygiene degree programme expanded on the NDHCs by including 'UBC graduate-specific competencies,' adding such competencies as scientific investigation, research use, policy use and leadership (26). This initiative may provide a stimulus for the development of credential-specific competencies.

Dental hygiene curriculum and provincial regulatory bodies (which govern scopes of practice) across Canada are inconsistent in their approach. This phenomenon is not unique to dental hygiene, but closely related to the fact that, in Canada, both health care and education fall within provincial legislative jurisdiction. Examples of the provincial variance for dental hygiene practice include discrepancies in the ability to administer local anaesthesia, to provide restorative services, to prescribe chemotherapeutic agents and to practice independently from a dentist. In addition to resistance from organized dentistry, much of this regulatory inconsistency stems from the varying models of entry-level dental hygiene education between provinces. The NDHCs most likely will be a positive force in supporting not only greater consistency between educational standards but also regulatory standards across Canada.

Future challenges for dental hygiene education

Education is regarded as an important attribute to promote professional development in Canada. The CDHA's policy statements and education agendas over the past decade for baccalaureate education to become entry-to-practice were created to support the continued professional development of

dental hygiene. However, the professional, social and political challenges to advancing education can be more pervasive than the educational ones.

Professional dominance of dentistry

The division of labour in the health care sector is hierarchical. Dentistry's professional dominance over dental hygiene has allowed the profession to devolve responsibilities to dental hygienists that have historically placed dental hygiene in a professionally subordinate position (21). Dental hygiene's scope of practice actually maintains dentistry's dominance by requiring that certain procedures be performed under the supervision of a dentist. For example, in the province of British Columbia, clients must have been examined by a dentist within the previous 365 days for a dental hygienist to provide services (27). In addition, dental hygienists in British Columbia may administer local anaesthesia, but may only do so under the supervision of a dentist or other emergency-trained professionals (27). Dental hygienists in Manitoba also experience supervision restrictions: dental hygiene services must be provided under the supervision of a dentist, unless a dental hygienist has practised dental hygiene for more than 3000 h and the client does not present with a complex medical condition (28).

Although amendments to these practice restrictions and scopes of practice are generally met with opposition from organized dentistry, some positive changes have still slowly occurred. Examples include dental hygienists in Alberta who, as of 2006, can enrol in a pharmaceutical module to prescribe medications associated with dental hygiene services (8, 29). Since 2007 in Ontario, registrants who have been approved by the College of Dental Hygienists of Ontario can self-initiate their treatment; dental hygienists can now scale and root plane teeth and curettage surrounding tissues without an order from a dentist (30). The CDHA has focused on self-regulation for the profession over the past few decades, producing encouraging results. With the exception of Prince Edward Island, all provinces in Canada have established self-regulation for dental hygienists, most recently in Newfoundland and Labrador in 2010 (Table 3) (J. Lux, personal communication). The number of dental hygienists in Canada's three territories is quite small; thus, the government continues to handle the regulation of the profession in those jurisdictions (J. Lux, personal communication). However, the CDHA is currently lobbying for the ability to practice independently from dentists in those territories (J. Lux, personal communication). To further advocate for changes in scopes of practice and restrictions, professional associations may be well advised to allocate their resources more so to advancing dental hygiene education.

One of several inherent barriers to challenging dentistry's dominance is the underdeveloped formal knowledge base of dental hygiene in Canada. Education is known to decrease power differentials between individuals and groups (21). The amount of education, the extent to which it is specialized and the content of what is learned are important components of professionalization theories, such as Pavalko's foundational Attribute Theory of Professions (6, 31). The inference regarding 'amount' is that the greater the education required, the more professional the occupation. The degree of specialization in dental hygiene education is high and is related to dental hygiene serving as the only health profession dedicated to the prevention of oral disease (6). The periodontal preventive therapeutic services provided by dental hygienists can be considered uniquely dental hygiene (21). However, dentists may also provide client care typically provided by dental hygienists.

Table 3. **Years in which the dental hygiene profession established self-regulation in the different provinces in Canada (J. Lux, personal communication)**

Province	Self-regulation
Quebec	1975
Alberta	1990
Ontario	1994
British Columbia	1995
Saskatchewan	1998
Manitoba	2008
New Brunswick	2009
Nova Scotia	2009
Newfoundland & Labrador	2010
Prince Edward Island	—
Northwest Territories	—
Nunavut	—
Yukon	—

Progress towards more advanced theory development in dental hygiene is limited by the length of current 2–3 year diploma programmes which focus heavily on the clinical skill required for entry-level practice. Education in dental hygiene resembles an hour-glass. There is an abundance of diploma programmes in Canada, and there are also numerous and various graduate degree programmes from which to choose (outside of dental hygiene). The constriction lies with access to baccalaureate education in dental hygiene which will open the pathways to graduate education where dental hygienists can develop more advanced critical thinking and research abilities (8).

Efforts to further develop the entry-level knowledge foundation which supports dental hygiene practice to meet the public health care needs of the 21st century has potential for securing government recognition (21). Persuading governmental, professional and public opinion that dental hygienists are uniquely qualified is difficult though when approximately half of the dental hygienists in Canada have received only 2 years of post-secondary education. Dental hygiene may more easily stake its claim to the oral care preventive body of knowledge if its entry-to-practice credentials were standardized at a higher level, much like other health care professions in Canada such as nursing, physical therapy, occupational therapy, dietetics and laboratory technology. However, budgetary resistance within dental faculties in universities and political resistance from dental organizations have played a notable role in preventing dental hygiene from advancing its entry-level knowledge foundation to a baccalaureate degree (3). Current baccalaureate opportunities for dental hygiene are located within faculties of

dentistry; this may continue to raise questions of power and control from a dominant profession in the educational arena.

Bifurcation effect

Another challenge to advancing dental hygiene entry-to-practice education is the reported 'bifurcation effect' that, for example, baccalaureate education has had on the nursing profession in North America (3, 32). This bifurcation has resulted in two streams of nurses, one with more education and skill and the other service-oriented and less educated (3, 32). Nurses in the United States returning to school for their baccalaureate degree in nursing have reported a shift in thinking, from the technical to the professional, from practice that was automatic to one that centres around problem solving (33). In addition, tensions exist between the public's demand for efficiencies and affordability, and dental hygiene's focus on baccalaureate education and professional recognition and advancement (3). Organized dentistry may use this source of tension and the bifurcation effect to hinder dental hygiene's quest for baccalaureate degree entry-to-practice education in Canada (3). It seems paramount to continue to foster a collaborative relationship between both professions not only to overcome some of the traditional hierarchy, but also to benefit public access to oral health care services.

Governmental policies and credential creep

The structure and policies within government also serve as barriers to advancing dental hygiene education. The governance structure of Canada firmly places education within provincial jurisdictions, thus making a consistent national system of higher education for dental hygiene a challenge. Canadian universities are generally legislated as autonomous institutions, but in times of economic uncertainty and shrinking educational dollars, there are increasing tensions between provincial accountability and institutional autonomy (34). The current focus in government with regard to higher education is directed towards the evaluation of present structures and performance, requiring professional programmes such as dental hygiene to provide evidence that the need to change such structures, such as entry-level education, is warranted (34).

Related is the 'credential creep' argument. The credentialing process in Canada is becoming increasingly complex (35). The Health Council of Canada states that self-regulating health professions are setting entry-to-practice standards at higher and higher levels. One view is that credential enhancements are based on concerns about patient safety and reflect the rising expectations of healthcare professionals. Others view the trend as an unnecessary 'credential creep' and question whether this quest for higher entry-level standards arises from professional self-interest and whether it may work against the development of team-based interdisciplinary care (35). From the government's perspective, 'credential creep' has other consequences. Public programmes will require additional funding, and graduates may seek higher compensation which they feel is justified by the additional education they have received (36).

The Health Council also states that increases in credential requirements should occur only when there is evidence that the additional education results in an improvement in the quality of patient care and patient outcomes. The provinces and territories in Canada have agreed to a standardized process for reviewing changes to entry-to-practice credentials for health professionals. As of 2004, this complex process involves the collaboration of the Federal and Provincial Ministries of Health and Ministries of Post-Secondary/Advanced Education (37). Professions proposing such changes are required to complete a detailed submission outlining the rationale for and evidence supporting the change (35, 37).

Our recent Canadian study is the first to suggest that dental hygienists who have completed a dental hygiene degree report providing a higher level of care (38). However, evidence suggesting that this higher level of care translates into improved client outcomes has yet to be investigated. Such evidence may also change the attitudes of dental hygienists in Canada who continue to practice with a diploma, because the outcomes of higher education on client care were unknown. Research in this genre would provide insight into the education required for the more complex care that many are providing in varied practice environments.

However, conducting such research on outcomes of baccalaureate education on client care is challenging because of the limited number of degree programmes and baccalaureate dental hygienists in Canada. Government ministries are requiring evidence of improved client care after baccalaureate education before a sufficient number of these programmes exist – a 'catch 22'. The focus for dental hygiene professional associations may need to be directed first at increasing the number of baccalaureate programmes and advocating for research on outcomes of client care. The goal for degree as entry-to-practice may be too ambitious at this point.

As in many countries, the dental hygiene profession is additionally challenged by its gender characteristics and the nature of the professional work of dental hygiene compared with that of dentistry's (6, 21). Balancing the present and future needs of the dental and dental hygiene professions, individuals within those professions, and the public will be an ongoing professional and political challenge.

Conclusion

The evolution of dental hygiene education in Canada over the past few decades has been divergent. Numerous new 2–3 year diploma programmes have recently emerged, particularly in private institutions across the country. Concurrently, the profession has witnessed a progressive movement towards baccalaureate education. Dental hygiene education in Canada has come full circle with regard to educational setting since the first programmes emerged in the 1950s and 1960s. Universities that saw diploma programmes leave for community colleges in the 1970s and 1980s have witnessed the return of dental

hygiene programmes in the form of baccalaureate education, particularly over this past decade. While baccalaureate education may provide opportunities and broaden perspectives for dental hygienists, it may also create a divisive climate within the profession that should be acknowledged.

Dental hygiene has a number of national documents which outline the profession's educational goals and needs. These documents compliment each other and provide some forward impetus. Most recently, the development of the dental hygiene national educational competencies provides an important framework to support greater consistency of entry-to-practice educational standards. However, educational reform for the profession will require more than simply the creation of documents and discourse. Research on outcomes of higher education on dental hygiene services is needed. The accountability policies within government require the profession to provide such information. Evidence of improved practice outcomes and client care after baccalaureate education will be more effective in changing governmental and professional perceptions about higher entry-level education for dental hygiene. Dental hygiene professional associations have experienced great success establishing self-regulation across the country. Perhaps it is now time for the associations to allocate more of their resources towards these research and education issues.

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